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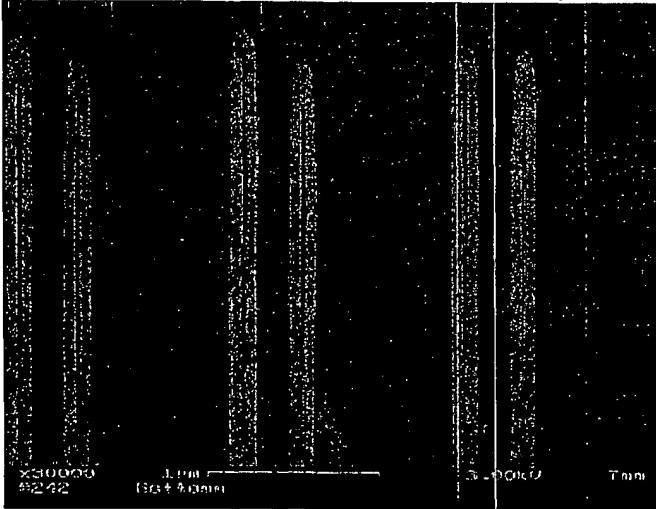
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(54) Title: VAPOR DEPOSITION OF TUNGSTEN NITRIDE



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(57) Abstract: Tungsten nitride films were deposited on heated substrates by the reaction of vapors of tungsten bis(alkylimide)bis(di-alkylamide) and a Lewis base or a hydrogen plasma. For example, vapors of tungsten bis(*tert*-butylimide)bis(dimethylamide) and ammonia gas supplied in alternate doses to surfaces heated to 300 °C produced coatings of tungsten nitride having very uniform thickness and excellent step coverage in holes with aspect ratios up to at least 40:1. The films are metallic and good electrical conductors. Suitable applications in microelectronics include barriers to the diffusion of copper and electrodes for capacitors. Similar processes deposit molybdenum nitride, which is suitable for layers alternating with silicon in X-ray mirrors.

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